Proposed Transportation Work Program Project
Proposed by: Qing Xia/Mark Schlappi

- Title: 2006 Arterial Traffic Volume Survey & Traffic Count Map

- Brief Description
  The purpose of the study is to collect traffic volume data and to create a traffic count map on arterial locations in the MAG urbanized area. The traffic volume data will be used to calibrate the MAG travel demand model, to provide baseline information for engineering, planning and design studies, and to accommodate the needs of MAG member agencies, traffic engineers, and the general public.

  There are two major data sources: one is from MAG member agencies and the other is from MAG Consultant. MAG will determine locations where counts from member agencies can be used, and the traffic counts not being done by MAG member agencies will be collected by the MAG Consultant. Our plan is to collect the traffic counts at the same locations with those in 2003 so that we'll have at least one traffic count for approximately every other mile section of an arterial roadway in the MAG urbanized area. In the 2003 study, we processed about 6000 directional counts, and used about 4200 in our database (1600 were collected by the MAG Consultant). The traffic counts collected in this survey along with available counts from MAG member agencies will be used to create a count database and a traffic count map.

- How the project fits with MAG's mission:
  Results from the arterial traffic volume survey will be documented in a database and a count map will be created. Traffic volume data will be used to validate the MAG travel demand model so the traffic forecast used for decision-making may be updated to reflect any changes in traffic patterns. As the most common measure of roadway demand, the traffic volume data will provide baseline information for engineering, planning, pavement design, and TIP studies.

- Resources Required:
  a. Consultant: $110000
  b. Staff: $ 70000 (about 2100 hrs): see Appendix for details of the estimates.
  c. Other:
  d. Proposed Budget: $180,000
  e. Need for on-going funding or update: With rapid population growth and change of traffic patterns in the MAG region, it is necessary to conduct traffic volume survey and update our database and count map approximately every 3 years.

- Expected Outcome:

A new traffic count map and database will be created upon the completion of the project. Data will be available on a CD and on MAG web site. A table with peak period data will be generated for the validation of the forecast model. Some statistical analysis will be performed to understand the historical traffic pattern, and to generate some factors that we need in the forecast model.

- Benefit to MAG Member Agencies:
  The traffic volumes on all of the region's arterials and freeways will be available on one map. The traffic volume data will accommodate the needs of MAG member agencies. The vehicle classification counts will benefit the member agencies also because vehicle classification counts will provide truck traffic volumes, which are often used for pavement design, and road improvement studies, etc.

- Benefit to the Public:
  The traffic volume data will accommodate the needs of traffic engineers, real estate agents and the general public. The traffic volume data is one of the most frequently requested data as well as one of the most accessed data on the MAG web site.

Appendix: estimates of staff cost:

Unlike other projects, where the consultants do most of the work, staff will do more than half of the tasks for this project. Except the data collection work to be done by the consultant, all the other work, such as data input (data from the MAG member agencies), data aggregation, data quality control, map producing, statistical analysis, etc., will be done by staff. These tasks include:

i. Determine the locations for which counts from member agencies could be used. Import the raw counts for those locations into the count database.
ii. Determine the locations for which counts will be commissioned by our consultant
iii. Process all the counts from MAG member agencies and from MAG consultant to get counts by 15-min, hourly and daily.
iv. Quality control all the counts to ensure data quality. Various quality control checks are to be conducted. In the case where the data does not pass the quality control checks, investigations will be conducted to explain why the data is likely accurate due to incidents, constructions, or specific equipment bias on the sites. The suspicious data due to the equipment errors are cropped out from the database.
v. Create count database
vi. Create traffic count map
vii. Conduct statistical analysis to understand historical trend and and some factors needed in the forecast model, e.g. PHF, K factor, etc.
viii. Project management and administration: advertise, select consultant, contract writing, oversee consultant work, contact with MAG member agencies, etc.

Please note that the tasks are not one-time tasks. They might need to be performed several times. For example, after we get feedback on the data (e.g. we get new counts and reset counts from the data providers), we'll need to reprocess them.

Workload estimate:

Assume we will collect the same number of directional counts as we did in the 2003 survey: i.e. approximately 6200 directional counts, 1352 of which were collected by MAG Consultant.

1) Import raw counts to the database: (6200-1352)*5min/each / 60=404 hrs

2) Customize VB programs written in 2003. This includes to make changes according to the new count format and to improve the programs. The number of programs that need to be re-customized estimated as follows:
   a. About 12 programs were written to aggregate and QA the counts by each MAG member agencies.

b. We plan to get counts from about 10 MAG member agencies
c. For counts collected by MAG consultant, 27 programs were written in 2003.
d. Put all the counts together and create final database: about 25 programs were written. These include the procedures to union all the counts from different data sources, to apply seasonal factors to each count, to get peak period data in a format that could be input into the forecast model, to create statistics, such as peak hour factors, to create interface for easy access of the data, etc.

Calculation: Assume each program needs 2 hour to improve.

VB program improvement man-hours=

(12*10+27+25)*2hr = 344hrs

3) Process the data: mainly run the VB programs.
   Assume: to run each set of programs (for different data source): about 8hr is needed. For counts collected by consultants, 16 hours are needed. 3 times of run are assumed to be made.
   (8h*10+16)*3=288hrs

4) Quality control process: after running the programs, we will need to check the suspicious counts. The method is to graph them and check the patterns. Assume for each counts 20 minute is needed to graph, find the problem, document and contact with the count provider (MAG member agencies and/or MAG consultant).

   Assume 10% of the total counts need to be checked.
   6200*10%*20min/60=207 hrs

5) Assume 3 weeks time to clean data and create a GIS count map
   3*40=120 hrs

6) Project management and administration: 300hrs

Total man-hours=(404+344 +288+207+120+300)/.8=1663/.8=2078hrs